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ZOÖLOGY.

ANTIDOTE TO THE SCORPION'S STING.—Already an antidote has been discovered to the sting of scorpions, which, although rarely fatal, is extremely painful, while the poison is closely allied to that of the venomous snakes. Mr. A. M. Markham, of the Indian Civil Service, has written to one of the Indian papers calling attention to the fact that the root of *Achyranthes aspera*, known popularly as *chirchirra*, affords almost instantaneous relief from the pain caused by the sting of a scorpion. The plant is very common everywhere in India, and is one of those whose clinging burrs are such a nuisance on one's legs when out shooting. The root, macerated in water, is applied to the part stung, and a small quantity is drunk in water. If this be done quickly, there is absolutely no pain half an hour or so after the sting, instead of the twelve to twenty-four hours of intense suffering which follow an untreated sting.—*London Standard.*

THE CRUSTACEA OF THE BLACK SEA.—Mr. Waldemar Czerniawsky, already known for his works on the fauna of the Black sea, has now published at Charkoff, a work on the "Crustacea decapoda Pontica littoralia," accompanied by several plates, being a very elaborate description of the Black Sea Decapods. The number of Pontic species of Decapods has been increased by twenty, reaching thus forty-eight species, with numerous varieties, though it will probably be greater when the depths of the Black sea have been better explored. The results of this work are numerous and interesting. The species offer altogether a very great variety of forms. The Black sea contains the local forms of Mediterranean varieties, while in the Celtic region are found the local forms of other varieties. The author asserts that the metamorphosis of the superior crabs, such as Carcinus, which presents nine different stages, are a repetition of their genealogy, and arrives at a series of very interesting conclusions as to the genealogy of different species. All three species of Astacus which are found in the Ponto-Caspian fauna are maritime forms which have immigrated into sweet water, and even the *Astacus pachypus* Rathke, of the mountain-like Abran, is a remainder of a maritime fauna; so also Thelphuca, which has gigantic representatives in the South Caspian. Certain crabs reach really gigantic size in the Ponto-Caspian region, such as *Eriphia spinifrons* and *Carcinus mœnas* on the shores of Crimea and at Odessa. While most crabs reach a great development only in very salt and warm water, others reach the same size under the influence of reverse conditions. The Decapods of the Azof sea have not yet been explored. The descriptions of the species and their varieties being given in Latin, as also the explanations to the plates, the work is rendered accessible to all zoölogists, many of whom however, will regret not to be able to understand the notes (mostly zoö-topographical and sometimes adding minor details to the description), which are in Russian.—*Nature, March 5, 1885.*

THE MOLTING OF THE LOBSTER.—During the past season I have been able to make some observations on the mode of molting of the lobster. In Casco bay, Maine, the lobster molted during the second and third week of July. According to the lobster-fishermen, the creature molts but once a year, and as confirmatory of this the lobsters we saw were in several cases covered with patches of polyzoans, with large barnacles, mussels, etc., which could not have been of the present year's growth.

Shortly before the animal molts the parts between the segments are much swollen, and have a livid color. Meanwhile the inner side of the flattened basal joints (3–5) of the large claws become soft, the lime on the crust partly disappearing, leaving an irregular oval solid portion; in this way the contents of the large hand or claw can be drawn through the basal portion of the limb. The first step in the ecdysis is the splitting or partial separation of the two halves of the carapace; it may entirely separate posteriorly, or the two halves remain together, and the animal withdraws its body out of the sutures between the thorax and first abdominal segment. The integument of the legs is molted last, and when owing to rough handling, the process is delayed, the extremities of the legs slough off. The entire integument, with all the appendages of the head, thorax, and the abdomen are molted as a whole, but the abdominal legs are molted before the thoracic ones. I have found all the parts of the crust connected, and floating in the "lobster car," even including the lining of the proventricle or stomach, and the apodemes of the head and thorax. After the molt the soft and flabby lobster lies nearly motionless, occasionally, if disturbed, giving a flap with its "tail." It remains inactive for nearly or quite a week, until the new crust becomes hard.

I am convinced from my observations that the deformities in the big claws as well as other parts occur at the time of molting; as after disturbing the symmetry of the claws in our specimen, the deformity persisted.—*A. S. Packard.*

THE OLDEST TARSUS (Archegosaurus).—The Neues Jahrbuch für Mineralogie, Jahrgang 1861, pp. 294–300, contains a paper by Professor Quenstedt, of Tübingen: "Bemerkungen zum Archegosaurus." On Plate III, connected with that article, a nearly entire hind-foot of Archegosaurus is figured (fig. 6). The tarsals of this foot are preserved in their original position, and it is of very high interest; but, strange to say, this figure of Archegosaurus has been entirely overlooked, and is never mentioned in any paper relating to the tarsus of vertebrates.

Professor Quenstedt believes that there are ten or twelve tarsal bones preserved. The question now is, What are the homologies of these bones?

On the whole, the hind-foot recalls very much that of Cryptobranchus and Menopoma. One or perhaps two bones are connected with the tibia; if there is only one, this must be the tibiale. Two elements are attached to the fibula—the intermedium and the fibulare. Four metatarsals are preserved, but it is possible that there were five. Each of the four metatarsals is supported by one tarsal bone. Between the four bones of the distal series and those of the proximal one there are to be seen *four* additional bones. The inner one I consider the $tarsale_1$, belonging to the first digit not preserved. The remaining three bones must be considered as three central bones.

If two bones are connected with the tibia, the outer one represents the tibiale, the other one a centrale, reaching the tibia in the same way as in Salamandrella (Wiedersheim). In this case, we have four central bones. Between the fibulare and $tarsale_5$ there is a large space without any bones. There is little doubt, I think, that there existed a sixth tarsal bone in the distal series, as in Cryptobranchus, remaining cartilaginous, and therefore not preserved.

Wiedersheim[1] described three central bones in the tarsus of the Axolotl; fig. 8, pl. XXX, comes nearest to the condition in Archegosaurus.

There are two explanations of the morphology of the tarsus in Archegosaurus, if there are five digits:

1. Tibiale, intermedium, fibulare; $centrale_1$, $centrale_2$, $centrale_3$; $tars._1$, $tars._2$, $tars._3$, $tars._4$, $tars._5$, $tars._6$.

2. Tibiale, intermedium, fibulare; $centrale_1$, $centrale_2$, $centrale_3$, $centrale_4$; $tars._1$, $tars._2$, $tars._3$, $tars._4$, $tars._5$, $tars._6$.

Archegosaurus belongs to the Rhachitomi, the oldest batrachians known. *The presence of certainly three, perhaps four central bones, is a new proof for the correctness of the position given to this group by Professor Cope.—Dr. G. Baur, Yale College Mus., New Haven, Conn., Dec. 17, 1885.*

THE INTERCENTRUM OF LIVING REPTILIA.—The Pelycosauria of the Permian formations possess intercentra in the dorsal, lumbar and sacral regions. In no living reptile have intercentra been described, so far as I know, in that part of the column, excepting in Sphenodon (Hatteria).[2] I find them also in *Gecko verticillatus* Laur. (*G. verus* Gray). In these forms intercentra are developed between *all* vertebræ.

It is probable that the same elements will be found in the other Geckonidæ and in the amphicœlian Uroplates, the only genus of the family Uroplatidæ.

Lumbar intercentra in the Mammalia are first mentioned by Owen[3] in the mole. Meyer[4] finds these elements also in the posterior dorsals and the sacrals, and I can confirm his observations. —*Dr. G. Baur, Yale College Mus., New Haven, Conn., Dec. 19, 1885.*

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[1] Wiedersheim R. Ueber die Vermehrung des Os centrale im Carpus und Tarsus des Axolotls. Morph. Jahrb., Bd. VI, 1880, pp. 581–583, pl. XXX.

[2] See Albrecht, Bull. Mus. Roy. Hist. Nat. Belgium, 1883, p. 190.

[3] Owen, R. On the cervical and lumbar vertebræ of the mole (*Talpa europæa* L.). Brit. Assoc. Rep., 1861, pp. 152–154. London, 1862.

[4] Meyer, O. Insectivoren und Galeopithecus geologisch alte Formen. Neues Jahrb. für Min., 1885, Bd. II, pp. 229–230.

THE INTERCENTRUM IN SPHENODON.[1]—Researches into the embryology of the Urodela and Anura have not yet brought to light any traces of the rhachitomous structure; a condition of things which is probably due to cœnogeny or falsification of the embryonic record—a phenomenon which is not uncommon. There can be no doubt, however, that the entire record was presented in the embryonic history of Permian land Vertebrata, and for a long period subsequently, but that the rhachitomous stage has been, *with the true centrum,* lost from the batrachian line at least. The only existing reptile which could be expected to show important traces of the ancestral, or embolomerous stage, is Sphenodon. This genus, as is well known, is the living representative of the order Rhynchocephalia, the nearest order to the Theromorpha. Having fortunately a specimen in alcohol, presented to me by Dr. Hector, the able director of the Geological Survey of New Zealand, I examined the caudal vertebræ to determine the connections of the chevron bones. I find these to be attached, not principally to the centra, but to a cartilaginous disciform intercentrum, closely resembling that of Cricotus.[2] The intercentrum has so much the form, including the rounded superior surface and the foramen chordæ dorsalis, of that of the Permian genus of Batrachia, as to impress on me still more strongly the probability of the Embolomeri being the batrachian type which is ancestral to the Reptilia. An illustrated memoir on this subject is at present in press.

The centra differ much from those of Cricotus in their form, resembling in outline those of the Pelycosauria. They however have the vertical median partial suture seen also in the Lacertilia, as already described by Günther. The caudal vertebræ are so gradually modified as we followed them forwards, however, as to make it probable that these halves do not represent any of the elements of the rhachitomous column besides the true centrum.

I add that there is probably a hypocentrum pleurale in the cervical region of the rhachitomous Eryops. They become ossified early with the posterior side of the intercentrum in front of them.—*E. D. Cope.*

ON THE TARSUS OF BATS.—In the course of some recent observations made upon the tarsus of bats, I ascertained that the astragalus and calcaneum were elongate, and exhibited the general characters of these bones in mammals in which little or no weight is borne upon the posterior extremities. Both bones were so disposed that the larger end of each is directed proximally. The general form was that of a metatarsal element, with the exception of the body or shaft, which was notably narrowed. In Rhinolophus the calcaneum entered into the ankle joint. In the other forms examined the calcaneum was independent of the

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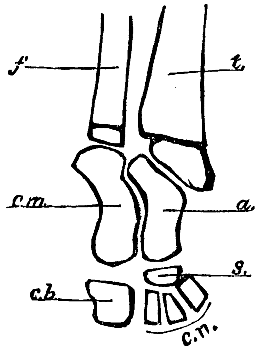
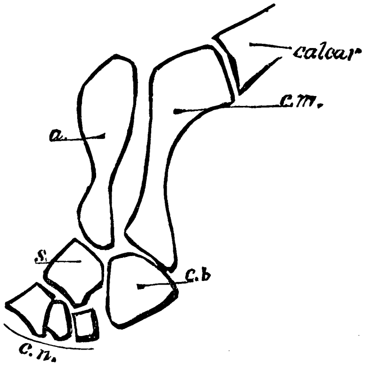
[1] On the Batrachian Intercentrum, NATURALIST, 1866, p. 76.

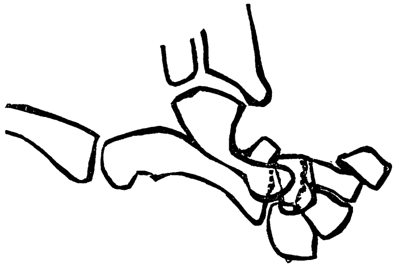
[2] Since the above was written, Vol. II, pt. II, of Fritsch's Fauna der Gaskohle has come to hand. It contains a note on the intercentra of Sphenodon.



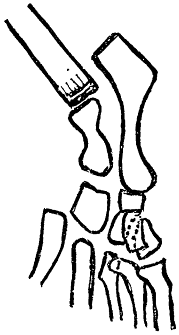
Rhinolophus capensis (young).



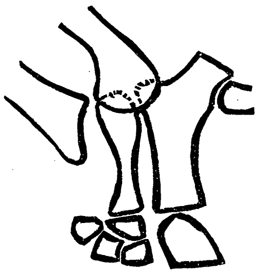
Carollia.



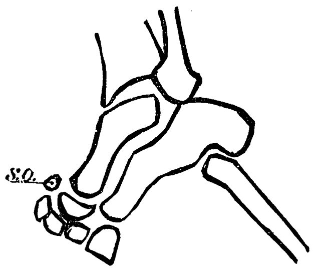
Chilonycteris.



Rhynchonycteris.



Vespertilio subulatus.



Atalapha novæboracensis.

f, fibula; *t*, tibia; *cm*, calcaneum; *a*, astragalus; *s*, scaphoid; *cb*, cuboid; *cn*, cuneiforms; *so*, supernumerary ossicle.

joint. In the Phyllostomidæ (as well as in Natalus and Rhynchonycteris) the calcar of the calcaneum was placed in axial line with that of the bone last named. In other families the calcar was adjoined to the calcaneum at the outer side and near the proximal end. The astragalus and calcaneum were nearly of the same size in most forms, the calcaneum being the larger. In the aberrant form Rhynchonycteris the astragalus was nearly twice the length of the calcaneum. I have appended a few diagrammatic sketches of the tarsus.

The method employed in studying the tarsus consisted in removing all the soft parts of the foot, immersing in absolute alcohol, transferring to oil of cloves and mounting on a glass slide. A low power of the microscope resolves all the essential structures. —*Harrison Allen.*

RANGE OF THE AMERICAN BISON.—Late issues of the St. Paul *Pioneer Press* report: "Reliable cowboys just arrived in Miles City, Mont., report that at the Lower Musselshell round-up they saw a fresh trail of about 100 buffalo on the head of the Big Porcupine last week, and had seen twelve head a few days before. They killed one out of the twelve. The number of wild animals on the North Yellowstone ranges have proved not only a source of annoyance to herd owners, but also of great damage to these newly stocked ranges. Round-up parties, in scouring those districts this spring, complain of the great number of calves killed and crippled by wolves and other wild animals. On Custer creek calves were found that suffered from torn and bitten backs, which the boys attributed to the attacks of wildcats. Had the calves been hamstrung the work would have been charged to wolves instead of wildcats. The loss from the above source is probably greater than most people would imagine." "The Maginnis boys met on their last trip probably the last remnant of the mighty herds of bison that once roamed over these plains. About 200 wanderers were encountered in Flatwillow Creek bottoms, and for a time the round-up lived on succulent, juicy buffalo humps instead of choice Montana beef."—*Forest and Stream.*

ZOOLOGICAL NEWS.—*Invertebrata.*—Professor H. Carpenter, reviewing the arguments of the French naturalists against, and of the German in favor of, the separateness of the blood-system and water vacuum system in echinoderms, states his belief in their separateness. Ludwig's observations have as yet not been disproved, as no one has ascertained that the blood-vascular system communicates with the exterior through the madreporite.——Five new Bulimini from the Levant have been described by Dr. O. Bœttger (P. Z. S., 1835, 23).——The ninth part of the description by the late T. G. Jeffreys, of the Mollusca of the *Lightning* and *Porcupine* expeditions contains the Yanthinidæ, Naticidæ, Neritidæ, Solanidæ, Xenophoridæ, Velutinidæ, Cancellariadæ, Aporrhaidæ, Cerithiidæ, and Cerithiopsidæ, seventy-five species in all.——The worm *Gordius verrucosus*, obtained by Mr. Johnston on Kilimanjaro, is found also in South Africa, Ceylon and Central America.——A river-crab from Kilimanjaro is by Mr. E. J. Miers referred, with some hesitation, to *Thelphusa depressa.*

Batrachia and Reptilia.—Mr. W. B. Spencer contributes (Quart. Jour. Mic. Soc., 1885) some notes on the early development of *Rana temporaria*, with especial reference to the fate of the blastopore, and the development of the cranial nerves, which seems to be a more ancestral process than the method of their development in Elasmobranchs and birds.——G. A. Boulenger describes (P. Z. S., 1885, 22) a new species of frog, *Rana macronemis*, from Asia Minor. Its nearest ally is *R. temporaria.——Lepidosternon polystegum* is a Brazilian amphisbænoid with a sharp-edged cutting snout and singular scutellation of the top of the head. By means of its snout it has been known to cut its way through the side of a coral snake which had swallowed it.

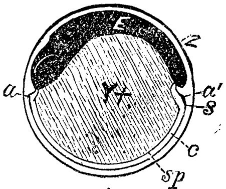
Birds.—Mr. T. H. Guillemard (Proc. Zoöl. Soc. Lon. 1885), gives a provisional list of the birds known to inhabit the Sulu archipelago. These are sixty-five in all, including sixteen previously listed by Mr. Sharpe. If birds of wide distribution are deducted, thirty-nine species are left, out of which thirty are formed in the Phillipines.——Professor W. Watson has contributed to the Proc. Zoöl. Soc. London some interesting notes on Peruvian birds. He has rediscovered the cliff-swallow, *Petrochelidon ruficollis* Peale. This bird was long searched for in the Andean valleys, and was ultimately found close to Lima. The nest is always found on human habitations. *Psittacula andicola* is a parrot which is peculiar to the higher parts of the western valleys of Peru, and occurs in the valley of the Rimac wherever vegetation is on the mountain sides. *Cypselus andicola* inhabits the western valleys of the Peruvian Andes from 6000 to 13,000 feet. The birds brought by Mr. H. H. Johnston from Kilimanjaro include fifty species, of which six, *Muscicapa johnstoni, Pinarochroa hypospadia, Pratincola axillaris, Nectarinea johnstoni* and *kikimensis* and *Cinniris mediocris*, are new to science. The second of these occurs at a height of 14,000 feet; the third at 10,000; the fourth at 11,000, and the last at 12,000. Few of the remaining species reach these great elevations, but *Palumbus arquatrix*, attains 10,300 feet, and *Corvultur albicollis* reaches up to the snow-line.——Mr. F. E. Beddard divides the Cuculidæ into Cuculinæ, with the genera Cuculus, Chrysococcyx, Cacomantis, and Coccystes? from the Old World, and Saurothera, Diplopterus, Piaya and Coccyzus from the New; Phenicophainæ, with the Old World genera, Phenicophæs and Endynamis; and Centropodinæ, with Pyrrhocentor, Centropus and Coua from the Old World, and Geococcyx, Crotophaga aud Guira, from the New.

Mammals.—Mr. Sidebotham (Proc. Zoöl. Soc. London, 1885) gives a detailed account of the myology of the water opossum, *Chironectes variegatus.*——The discovery of the wild cat (*Felis catus*) in Ireland, is often reported, but investigation has always shown that the supposed wild cat was but a feral specimen of the domestic cat.——A leopard skin in which most of the rosettes are replaced by black spots, numerous and of small size, has been brought from South Africa, and is the first African species which exhibits the tendency to melanism so strongly developed in some Asiatic individuals.——Mr. O. Thomas (P. Z. S. 1885, 329), distinguishes three varieties of the echidna, viz: *E. lawesi, aculeata* and *setosa.* The only remaining recent species of the family is *Taglossa bruijni,* a larger animal, found in Northwestern New Guinea.——A new species of paca (*Cœlogenys taczonowski*) is described by Sulzmann, who obtained it in Western Ecuador, where it inhabits mountains between 6000 and 10,000 feet above the sea. Like the well-known paca, it digs a burrow with two openings. The native name is Sacha-cui.

EMBRYOLOGY.[1]

THE ORIGIN OF THE AMNION.—The purpose of the present note is to point out some of the mechanical conditions and causes which have been competent, in the course of the *development of development,* to bring about the formation of the amnion. No embryological writer, as far as I am aware, has ever attempted to trace the amnion to the part in the embryos of anamniated forms which led up to its development in the amniated ones. Balfour said, that "it does not seem possible to derive it from any pre-existing organ" (Comp. Embryol., II, 256). And he says further (op. cit., 257): "The main difficulty is the early development of the head-fold of the amnion." Balfour's view, that it is developed *pari passu* with the outgrowth of the allantois, is utterly inadequate to explain the genesis of the amnion of insects or that of *Peripatus edwardsii* and *P. torquatus,* for in them no allantois is formed. His hypothesis also breaks down in the light of the brilliant researches of Selenka on the inversion of the layers in the Rodentia.

A comparison of the longitudinal, vertical, diagrammatic sections, figures *A* and *B,* of an osseous fish-egg and a mammalian ovum respectively, will conclusively show that the somatopleure *s,* in *A,* is the exact homologue of the layer giving rise to the amniotic folds in *B,* though in *A* this layer merely covers the space



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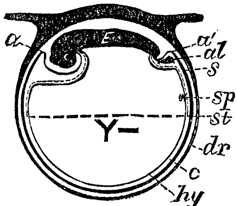

B

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[1] Edited by JOHN A. RYDER, Smithsonian Institution, Washington, D. C.